REMARKS

Claims 1-15 and 17-23 are pending in the present application. Claims 1-4, and 7 were amended. New Claims 17-23 were added. Support for these claims can be found generally throughout the specification. Claim 16 was cancelled in the prior Response filed February 28, 2002. No new subject matter has been added by the amendments or additional claims. Applicants respectfully request reconsideration of the present application in view of the foregoing amendments and the following remarks.

I. Prior Art Rejections:

Claims 1-15 stand rejected under 35 U.S.C. § 103 (a) as being unpatentable over U.S. Patent No. 5,698,322 to Tsai et al. (hereafter "Tsai"), in view of U.S. Patent No. 5,783,505 to Duckett et al. (hereafter "Duckett"). The Examiner submitted that Applicants' claimed properties are either inherently possessed in the combined Tsai and Duckett references, or in the alternative, are an obvious modification of the web created by the combined references. This rejection is respectfully traversed.

To establish a prima facie case of obviousness, the Examiner must establish that a prior art reference, or combined references, teach or suggest all the claim limitations of Applicants' invention. MPEP §§ 2142-2143. Also, the teaching or suggestion to make the claimed combination, and the reasonable expectation of success, must be found in the prior art, and not based on Applicant's disclosure. See MPEP § 2142; *In re Vaeck*, 947 F.2d 488, 20 U.S.P.Q.2d 1438 (Fed. Cir. 1991).

Currently pending Claim 1 is directed to a biodegradable nonwoven web having a moderate permeability within the range of about 500 to about 1500 μm^2 and a high void volume that is greater than about 25 cm^3/gram, and wherein the biodegradable nonwoven web is thermally bonded at a temperature less than 160°C, using convective heating. This web comprises a first biodegradable binder fiber that does not undergo severe heat shrinkage, and a second biodegradable thermoplastic fiber. Support for Claim 1 can be found throughout the specification, and particularly on pages 2-4, 13-15 and 18-21.

Applicants respectfully submit that the combination of the Tsai and Duckett references fails to teach or suggest Applicants' invention as recited in Claim 1. The combined references do not teach or suggest a biodegradable nonwoven web comprising a first biodegradable binder fiber that does not undergo severe heat shrinkage, and a second biodegradable thermoplastic fiber, and wherein the web is thermally bonded at a temperature less than 160°C, under convective heating, to achieve a moderate permeability and a high void volume.

The Tsai reference is co-owned by the Assignee of the present invention. This patent is directed to multicomponent fibers, wherein one component forms an exposed surface capable of thermally binding the multicomponent fiber to other fibers. The Tsai reference does not teach or suggest a nonwoven web comprising a first biodegradable binder fiber that does not undergo severe heat shrinkage, and a second biodegradable thermoplastic fiber, and wherein the web is thermally bonded at a temperature less than 160°C, using convective heating, to achieve a high void volume and a moderate permeability.

Duckett is directed to blends of natural cellulosic and thermoplastic biodegradable fibers. Typical compositions include cotton and cellulose acetate. The Duckett reference does not teach or suggest a nonwoven web comprising a first biodegradable binder fiber that does not undergo severe heat shrinkage, and a second biodegradable thermoplastic fiber, and wherein the web has a high void volume and a moderate permeability formed by thermally bonding the web at a temperature less than 160°C, using convective heating. The Duckett reference teaches a solvent-modified cellulose acetate that is used as the binder fiber in a thermally bonded nonwoven material (see Col. 3, lines 64-67, Col. 4, lines 9-13, Col. 5, lines 19-26). An appropriate solvent is used to lower the softening or glass transition temperature of the cellulose acetate, which results in improved binding of this fiber (Col. 11, lines 41-58). This reference teaches enhancing resin flow by lowering the glass transition temperature of the cellulose acetate. Thus, the Duckett reference requires a significant amount of amorphous regions in the cellulose acetate fibers to achieve the improved bonding. An increase in the amount of amorphous regions would result in an increase in the amount of heat shrinkage of the fiber. Shrinkage results from the thermally induced chain relaxations that take place in the amorphous regions of the fiber.

Thus, this reference teaches away from maximizing the degree of crystalline portions in the binding fiber, and therefore teaches away from a binding fiber that does not undergo severe heat shrinkage. An increase in the amount of fiber shrinkage results in a decrease in the void volume of the resulting web. Applicants respectfully submit that the solvent-modified cellulose acetate fibers, disclosed in the Duckett, in combination with the fibers disclosed in Tsai, would result in a web that contains two binder fibers, one of which would undergo severe heat shrinkage during the bonding process, and thus decrease the void volume of the resulting web. Applicants respectfully submit that the nonwoven webs formed by the combined references would not inherently possess the structural and fluid properties of Applicants' nonwoven webs, as recited in Claim 1.

In addition, the webs disclosed in Duckett are thermally bonded under heat and pressure, using thermal calendering, a form of conduction heating (Col. 5, lines 28-34, 46-56; Col. 11, line 34 – Col. 12, line 3). The thermal calendering applies both heat and pressure to bond the web. The pressure component aids in the bonding of the web. Pressure applied to the web results in a tighter, more compact structure, and this in turn, results in a lower void volume of the bonded web. Applicants' nonwoven webs, as recited in Claim 1, are not bonded using a pressure component, which results in a softer, bulkier web with a high void volume. The webs disclosed in Duckett are formed using processing parameters that differ from Applicants' claimed invention. Moreover, the Tsai reference does not teach or suggest the processing parameters of Applicants' claimed invention. Thus, Applicants again respectfully submit that the nonwoven webs formed by the combined Tsai and Duckett references would not inherently possess the structural and fluid properties of Applicants' nonwoven webs, as recited in Claim 1.

Applicants respectfully submit that the combination of the Tsai and Duckett references, fails to teach or suggest Applicants' invention as recited in Claim 1. The combined references do not teach or suggest a biodegradable nonwoven web, comprising a first biodegradable binder fiber that does not undergo severe heat shrinkage, and a second biodegradable thermoplastic fiber, and wherein the web is thermally bonded at a temperature less than 160°C, using convective heating, to achieve a moderate permeability within the range of about 500 to about 1500 μm^2, and a high void volume that is greater than about 25 cm^3/gram.

The combination of Applicants' materials and processing parameters create a strong web with unique fluid properties, not taught or suggested by these references.

Applicants also respectfully submit that unexpected properties support a conclusion of nonobviousness. MPEP §2144.08. As set forth in the pending claims, the webs have a high void volume with a moderate permeability. As would normally be expected to one of ordinary skill in the art, an increase in void volume would increase permeability, while a decrease in void volume would decrease permeability. However, the present invention is able to achieve a high void volume while keeping a low to moderate permeability. These fluid properties are unexpected, patentable features of the nonwoven webs, as recited in Claim 1. Applicants respectfully submit that these unexpected fluid properties may result from the formation, at low bonding temperatures coupled with convective heat treatment, of unexpected strong contacts, or bonding points, between the unique fibers of the web. The uniqueness of the present invention was shown in the application at page 3, line 21 to page 4, line 3, and more specifically in Table 3. As shown in Table 3, control samples 1 and 2 showed the "expected" fluid properties. Sample 1 (a current surge material) had a high void volume of 26.0 cm^3/g, with a corresponding high permeability of 2078 μm^2. Sample 2 (100% bicomponent PLA) had a low void volume of 14.3 cm^3/g and a low permeability of 402 μm^2. However, the present invention exhibited a higher void volume (31.6 cm^3/g) compared to sample 1, but unexpectedly, a much lower (by 41%) permeability of 1231 μm^2. Applicants respectfully submit that this evidence is sufficient to show that the claimed fluid properties are unexpected, unique results, and not an obvious modification of the Tsai reference, in view of the Duckett reference.

For at least the reasons given above, Applicants respectfully submit that Claim 1 is allowable over the art of record. Furthermore, since Claims 2-15 recite additional claim features and depend from Claim 1, these claims are also allowable over the art of record. Accordingly, Applicants respectfully request the withdrawal of this rejection.

Marked up version of re-written claims

Pursuant to 37 CFR §1.121(c)(1)(ii), another version of the rewritten claims marked up to show all the changes relative to the previous version of the claims is now set forth with deleted text shown in [brackets] and added text shown in underlining:

1. (Amended) A biodegradable nonwoven web having a permeability within the range of about 500 to about 1500 μm^2 and a void volume that is greater than about 25 cm^3/gram, wherein the web [includes] comprises a first biodegradable binder fiber that does not undergo severe heat shrinkage and a second biodegradable[,] thermoplastic fiber; and

wherein the biodegradable nonwoven web is thermally bonded at a temperature less than 160°C, using convective heating, to achieve the permeability and the void volume.

2. (Amended) The nonwoven web of claim 1, wherein the first fiber is a multicomponent fiber [including poly(lactic acid) (PLA)] comprising a surface component and a non-surface component.

3. (Amended) The nonwoven web of claim 2, wherein [the multicomponent fiber comprises a surface component and a non-surface component and] the surface component has a melting temperature at least about 10° C less than the melting temperature of the non-surface component.

4. (Amended) The nonwoven web of claim 3, wherein the second thermoplastic fiber has a melting temperature at least about 20° C higher than the melting temperature of the [first fiber] surface component of the multicomponent fiber.

7. (Amended) The nonwoven web of claim 2, wherein the [first] multicomponent fiber is a bicomponent sheath/core fiber.

The following new claims were added:

17. (New) The nonwoven web of claim 1, wherein the nonwoven web is thermally bonded at a temperature less than 150°C.

18. (New) The nonwoven web of claim 1, wherein the nonwoven web is thermally bonded at a temperature less than 145°C.

19. (New) The nonwoven web of claim 1, wherein the second biodegradable thermoplastic fiber does not melt.

20. (New) The nonwoven web of claim 2, wherein the nonwoven web is thermally bonded at a temperature 10 to 15°C above the melting temperature of the surface component.

21. (New) The nonwoven web of claim 2, wherein the nonwoven web is thermally bonded at a temperature 5 to 10°C above the melting temperature of the surface component.

22. (New) The nonwoven web of claim 2, wherein the nonwoven web is thermally bonded at a temperature 2 to 5°C above the melting temperature of the surface component.

23. (New) The nonwoven web of claim 2, wherein the nonwoven web is thermally bonded at a temperature 2 to 5°C below the melting temperature of the surface component.

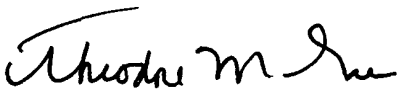
II. Conclusion:

The foregoing is submitted as a full and complete Response to the Final Office Action mailed May 22, 2002. For at least the reasons given above, Applicants respectfully submit that Claims 1-15 and 17-23 define patentable subject matter. Accordingly, Applicants respectfully request allowance of these claims. Early and favorable consideration of the claims is requested.

A check in the amount of $740.00 is enclosed to cover the fee for the Continued Prosecution Application. Also enclosed is a check in the amount of $54.00 to cover the cost for the three additional claims. No additional fees are believed due; however, the Commissioner is hereby authorized to charge any deficiency, or credit any overpayment, to Deposit Account No. 11-0855.

Should the Examiner believe that anything further is necessary in order to place the application in better condition for allowance, the Examiner is respectfully requested to contact Applicants' representative at the telephone number listed below.

Respectfully submitted,



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